NINTH SCIENCE AND TECHNOLOGY BOARD

29 MAY 2012

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9th Natick Soldier Systems Center Science & Technology Board Agenda
29 May 2012

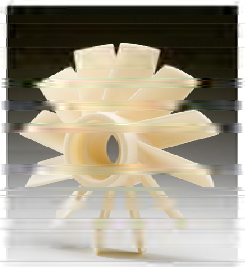
TIME	ACTIVITY	RESPONSIBILITY
0930-0935	Welcome/Introduction of New Board Members	Arnie Boucher/NSSC S&T Board Manager
0935-0945	Opening Remarks/Update from the Chair	Dr. Jack Obusek/Director, NSRDEC
0945-0955	Update - 5th District Day	BG John J. McGuiness/CG, NSSC
0955-1015	NSRDEC Technology Enabled Capability Demonstrations	Force Protection/Mr. Codega Sustainability-Logistics Basing/Mr. Rettie Overburdened-Physical Burden/ Ms. Kirsteins
1015-1035	Warrior Protection & Readiness Coalition	David Costello/Exec Director, WP&RC
1035-1050	MA Technology Dev. Corp. "START" Program	Jerry Bird/President, MTDC
1050-1110	Bolt "Connected Devices"	Pat Larkin/JAII Ben Einstein/Bolt
1110-1125	Soldier Performance Center Progress	Dr. Jack Obusek/Director, NSRDEC
1125-1145	Executive Session Discussion/Closing Remarks • Roundtable comments • Board operating standards	Dr. Jack Obusek/Director, NSRDEC All All

Adjourn

Additive Manufacturing Institute

Under an Air Force Research Laboratory BAA solicitation, the Office of the Secretary of Defense (OSD) through OSD Manufacturing Technology, is soliciting proposals to initiate and sustain an Additive Manufacturing Innovation Institute, the first institute to be launched within the National Network for Manufacturing Innovation (NNMI).

- On March 9, 2012, President Obama announced the NNMI to establish a pilot Institute and up to fourteen subsequent institutes for manufacturing innovation around the country.
- The Institutes will bring together industry, universities and community colleges, federal agencies, and our states to accelerate innovation by investing in industrially relevant manufacturing technologies.
- This solicitation is limited only to universities and non-profit [501(c)(3)] organizations, however, small businesses are encouraged to propose on all or any part of this solicitation as part of a teaming arrangement.
- The Institute is intended to be funded initially to a $60M level, of which $30M is multi-agency U.S. Government funding, and an additional $30M is desired to be as cost share, both direct and in-kind.



Proposal Due Date and Time: *14 June 2012 3:00 PM EST.*

Additive Manufacturing: Process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies, such as traditional machining.

UNCLASSIFIED

NSSC S&T Board Mutual Value Statement

Demonstrate the powerful benefit to the region of a strong network of DoD, multi-government, industry, and academic leaders. Create lasting opportunities through co-sponsored initiatives with shared goals that reflect commitment to leveraging resources and deep, continuous understanding of member priorities. Focus on developing and sustaining innovative personnel, facilities, and equipment capabilities that support the Warfighter and the regional economy.

Success will be recognized/acknowledged when we realize:

1. **An increase in formalized public/private relationships.**
2. **An increase in the awareness of the NSSCs S&T capabilities and opportunities in the industrial, academic and defense communities.**
3. **New relationships that leverage resources, create new assets, and increase the value of existing assets at the NSSC.**
4. **Transfer of technology by supporting both the development of commercial technologies to meet the needs of the Army (spin-in) and the commercialization of resident Army technologies (spin-out).**
5. **The benefits of utilizing Board resources to inform the regional economy of Defense funded opportunities resulting in increased business opportunities.**

Mutual Value Statement Metrics Accomplishments

1. An increase in formalized public/private relationships.

- Added four (4) new Board members to make the Board more regional in nature:
  - New Hampshire High Technology Council
  - Hanscom AFB
  - Naval Undersea Warfare Center
  - Massachusetts High Technology Council
- NSRDEC overarching CRADA's with all five UMass campuses (in routing)
- Patent License Agreement with Niche, Inc, New Bedford, MA (Ground impact parachute release mechanism)

Mutual Value Statement Metrics Accomplishments

2. An increase in the awareness of the NSSCs S&T capabilities and opportunities in the industrial, academic and defense communities.

- NSRDEC became a member of the "New England Textile Industry Roundtable" comprised of senior industry, academic, local and State government representatives.
- "Soldier Technology Day" at the State House.
- NSRDEC "STEM" briefing at the MetroWest Exec Connect Luncheon.
- NSRDEC participation at the MA High Technology Council Annual meeting.
- BG McGuiness featured speaker at the MetroWest Chamber of Commerce TD Bank Breakfast Meeting.
- NSRDEC DoD Combat Feeding Directorate participated in the MetroWest Chamber of Commerce "Taste of MetroWest Event" attended by BG McGuiness.

Mutual Value Statement Metrics Accomplishments

3. New relationships that leverage resources, create new assets, and increase the value of existing assets at the NSSC.
   - NSRDEC/Board support for 27 Gaylord Inkjet Printing Initiative to enhance inkjet printing systems to provide short-run camouflage capabilities for the Warfighter.
   - NSRDEC engaged with MA Governor Deval Patrick's "Advanced Manufacturing Initiative Working Group" to identify and revive a manufacturing capability within Massachusetts.
   - NSRDEC offered membership on MA Governor Deval Patrick's Science, Technology, Engineering & Math (STEM) Council.

Mutual Value Statement Metrics Accomplishments

4. Transfer of technology by supporting both the development of commercial technologies to meet the needs of the Army (spin-in) and the commercialization of resident Army technologies (spin-out).
   - NSRDEC continues to build/refine the web-based "Innovation Access Network" in conjunction with the MA High Technology Council to provide partnering/leveraging opportunities between the NSRDEC and New England high tech companies in conjunction with Warfighter technologies and capabilities.
   - Army 2012 SBIR Achievement Awards:
     - Migma Systems, Walpole, MA-Infrared IED and Landmine Detection Systems
     - Rothtec, New Bedford, MA-Digital Printing with Near Infrared Reflectance Properties

Mutual Value Statement Metrics Accomplishments

5. **The benefits of utilizing Board resources to inform the regional economy of Defense funded opportunities resulting in increased business opportunities.**
   - **NSRDEC made Board partners aware of the DoD Operational Energy Capabilities Small Business Conference.**
   - **NSRDEC made Board partners aware of the FY12 Defense Acquisition Challenge Program.**
   - **MA Office of Business Development made NSRDEC staff aware of the MDTC "Start" program that provides $6M to help grow and commercialize MA small businesses technologies developed under the Small Business Innovation Research Program.**
   - **NSRDEC made Board partners aware of the Army Rapid Innovation Fund funding opportunities.**

Army Rapid Innovation Fund Update

BACKGROUND: The Army Rapid Innovation Fund was established by Congress to fund ($500M) programs that facilitate the rapid insertion of innovative technologies into military systems or programs ***that meet critical national security needs.***

GOAL: The goals of the RIF reflect DoD's emphasis on ***rapid, responsive acquisition and the engagement of small, innovative businesses in solving defense needs.***

ARMY:
- Over 1000 White Papers received against Broad Agency Announcement
- 260 White Papers received against the NSRDECs three (3) TECDs
- $80M of Army funding released

NSRDEC RESULTS:
- 23 full proposals solicited
- 12 full proposals funded
- Force Protection-Soldier & Small Unit =4 proposals
- Overburdened-Physical Burden =3 proposals
- Sustainability/Logistics-Basing =5 proposals
- Total NSRDEC funding =$25,856,000

5 of the 12 funded projects are with *"New England"* companies!

Force Protection – Soldier and Small Unit (1.b)

Total ~$139M

Schedule & Cost

MILESTONES	FY12	FY13	FY14	FY15	FY16	FY17
Human Performance		4			6	
Ballistic & Blast Protection	4				6	
Environmental Protection		4			6	
Squad Protection		4			6	
Integration, Demo & Transition						

Purpose:

- Identify trade space to enable holistic protection design and implementation for Soldier and Small Unit using baseline data;
- Optimize protection while minimizing weight and maximizing mobility
- Capture technologies to improve Soldier and Small unit protection, against an array of threats (i.e. ballistic/blast, flame, laser, noise, CBRNE, health etc.)

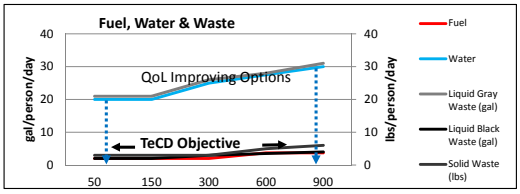
Results/Products:

- Increased understanding of current protection capabilities, vulnerabilities, and impact on performance (individual and small unit effectiveness)
- Analysis framework to design and select protection solutions based on Mobility, Lethality/Situational Awareness and Survivability trade space
- Integrated multi-spectrum Soldier and Small Unit protection technologies
- Prototypical Modular, Scalable, Tailorable Soldier ensemble and small unit surveillance equipment

Payoff:

- Increased Soldier/Small Unit Effectiveness (Mobility, Lethality/Situational Awareness, and Survivability)
- Improved holistic protection to enable reduction in casualties
- Squad organic capabilities provide protection through situational awareness

Sustainability & Logistics-Basing 4a
Program Summary



MILESTONES	FY12	FY13	FY14	FY15	FY16	FY17
Individual Technology Development 6.2/3			C	C	C	
Determine & Validate Operational & Technical Baselines						
Identify Initial Material & Nonmaterial Solution Spaces						
Plan Demonstration(s)						
Demonstrate Increment 1					6	
Industry Comparative Demo						
Demonstrate Increment 2						6
Capstone Demonstration (TBD)						

~$200M

Milestone Indicators: TRL ◇ Milestone Timeline:

Purpose: **To demonstrate an integrated approach to reducing sustainment requirements for small contingency base operations via a suite of capabilities that reduce the need to deliver water and fuel to the base and the burden of having to collect, manage, and dispose of solid and liquid waste.**

Results/Products (Demonstration of Integrated Capabilities That):

- **Reduce power requirements to environmentally condition habitation spaces (heat and cool)**
- **Increase power sourcing efficiency via more effective power generation and management**
- **Increase water use efficiency via water sourcing, recycling, repurposing, and management**
- **Reduce creation of solid and liquid waste products and optimize waste management**
- **Increase waste disposal efficiency via energy conversion and waste mitigation strategies**

Warfighter Payoff:

- **Small unit leaders have greater flexibility in positioning Contingency Bases based on mission need rather than sustainment convenience**
- **Sustainment management task reductions result in greater troop availability for mission operations**
- **Warfighters experience reduced exposure to threats during logistics operations & convoy**

Overburden-Physical Burden (2.a)
Technology Enabled Capability Demonstration (TeCD)

Overview Briefing to 9th Natick Soldier Systems Center Science & Technology Board

Dr. John Obusek; Director, U.S. Army Natick Soldier Research, Development and Engineering Center (NSRDEC)

Ms. Andra Kirsteins; Project Manager, Overburden-Physical Burden (2.a) Technology Enabled Capability Demonstration

Challenge Statement

Top 5

2.a Top 5

Problem Statement: Soldiers in Small Units (squads/fire teams/crews) are physically overburdened, often carrying up to 130lbs; this degrades performance and may result in immediate, as well as, long term consequences.

Challenge: Formulate a S&T program to significantly reduce the weight and volume of all items that individual Soldiers in a Small Unit must physically carry to accomplish their missions while maintaining or increasing the ability of the Unit to perform tasks, whether operating as dismounted or in vehicles.

Challenge Boundary Conditions:
Who: Soldiers and Small Units conducting extended dismounted operations in dispersed and decentralized complex environments (e.g. Afghanistan like)

What: Reduce physical burden within the squad so that no individual Soldier load exceeds 30% of their body weight.

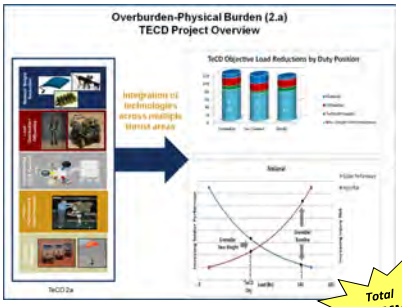
How: Establish baseline for various operations and for Afghanistan-like engagement conditions. Demonstrate a capability that reduces weight carried, improves operational mission effectiveness and reduces the risk of musculoskeletal injuries through a combination of materiel weight reduction, off-loading, tactical resupply and availability of load management aid tools.

Objectives:
Near term (FY17): Reduce physical burden of Soldier and Small Unit, including the grenadier, SAW gunner and attached combat medic, so that load reduction of the carried weight equates to a percentage not exceeding 50% of individual's body weight across the central 90% of the male Soldier population. The objective also is to achieve these load reductions without a reduction in operational capability.

Unmanned Ground Autonomy | Enhanced Protection
Soldier Load | Power and Energy Mgmt.

Thrust Areas and Enabling Technologies
TECD 2a: Overburdened - Physical Burden

TECD 2a: Overburdened- Physical Burden



Total ~ $136M

Schedule & Cost (ROM)

MILESTONES	FY12	FY13	FY14	FY15	FY16	FY17
Baseline Development						
Technology development						
System Integration						
Initial evals & demos						
Human Perf Studies						
Final Demonstrations						
Assessments &Reports						
Transition						
TOTAL ($M)	9.0	33.7	39.3	42.4	11.9	0.0

Purpose

- Reduce physical burden of dismounted Soldiers at the squad level to improve Soldier performance; increase squad effectiveness; and reduce risk of musculoskeletal injuries
- Reduce the weight and volume of items that individual Soldiers in a squad must carry to accomplish their missions with no reduction in operational capability
- Provide alternatives to Soldier carried load

Results/Products:

- Demonstrated capability , with supporting data, that shows improved Soldier performance, Squad effectiveness and reduced risks of musculoskeletal injuries
  - Integrated solution comprising of technologies & knowledge products
    - Lighter-weight Soldier items
    - Squad/SU offloading capability
    - Decision Aids for Load & Soldier Performance
    - Reliable, tactical resupply
    - Use cases; TTPs
  - Increased scientific knowledge of load effects on Soldier performance and musculoskeletal injury risk

Payoff:

- Significant weight reduction across the Squad that improves operational mission effectiveness and mitigates risk of injury attributable to load

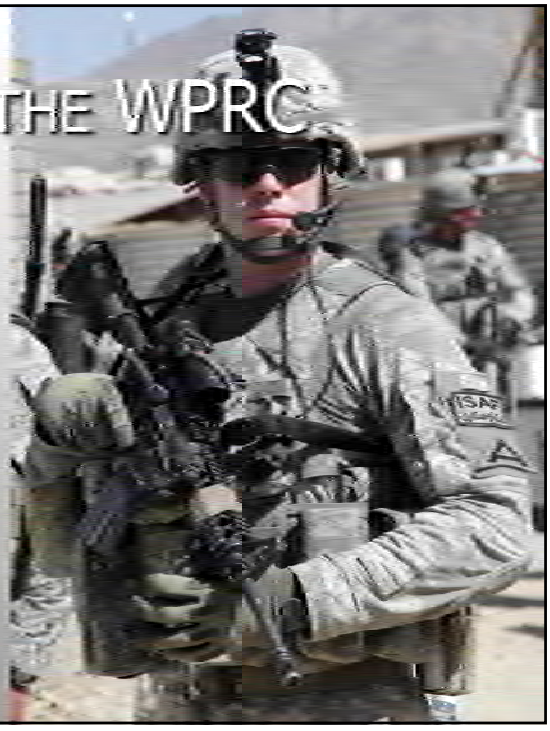
WPRC

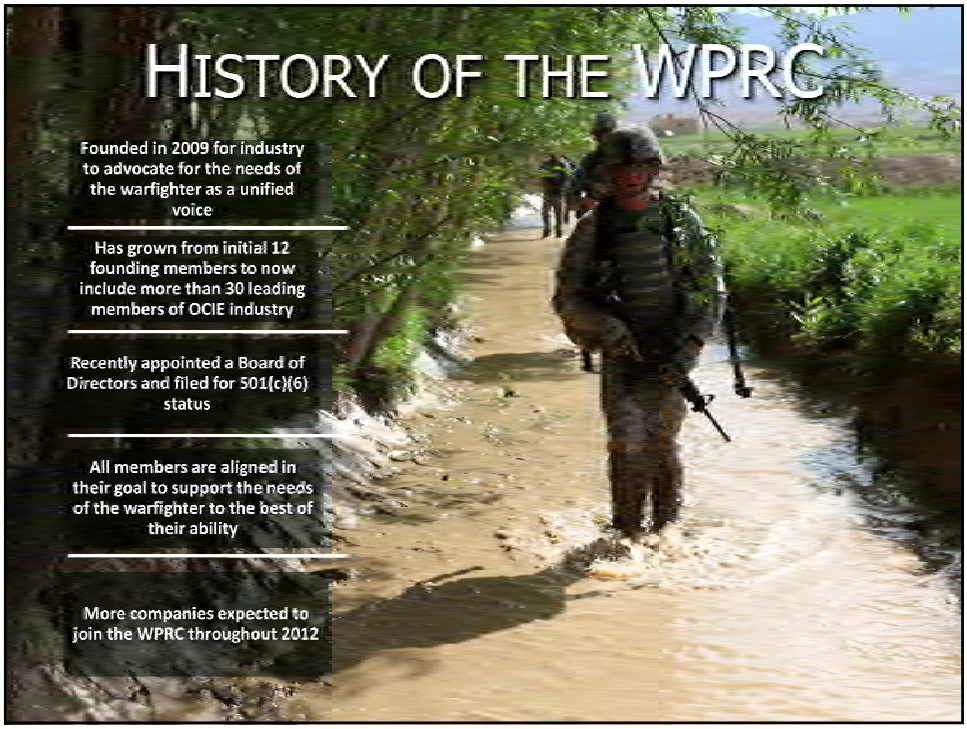
WARRIOR PROTECTION & READINESS COALITION

ONE TEAM. ONE VOICE.

MISSION OF THE WPRC

The Warrior Protection & Readiness Coalition (WPRC) is an advocacy organization of more than 30 leading companies in the warfighter clothing and protective equipment industry. The WPRC membership shares a commitment to ensuring that American service members enter harm's way with the best gear available. Better equipment saves lives and allows warfighters a greater level of operational readiness.




HISTORY OF THE WPRC
Founded in 2009 for industry to advocate for the needs of the warfighter as a unified voice
Has grown from initial 12 founding members to now include more than 30 leading members of OCIE industry
Recently appointed a Board of Directors and filed for 501(c)(6) status
All members are aligned in their goal to support the needs of the warfighter to the best of their ability
More companies expected to join the WPRC throughout 2012


WPRC MEMBERSHIP
ADS
WILD THINGS
LTC
POLARTEC
BATES
FORCEPROTECTOR GEAR
SILYNX
BENCHMADE
GERBER
bluewater defense
Milliken
GLEN RAVEN
BROOKWOOD
SUREFIRE
ceradyne, inc.
GORE
OTIS
SURVIVAL ARMOR
TENCATE
DARN TOUGH
INSIGHT
WILCOX
DUPONT
ilg
PELICAN

New England Companies

Brookwood
Insight
Polartec
Darn Tough
Pelican
Wilcox
Duro Textiles. Technologies. Solutions.
New Balance
Wild Things

Legislative Efforts

Educate key legislators on the importance of prioritizing sustained, direct funding of mission critical equipment.

Highlight the importance of the Berry Amendment to America's national security and domestic industrial base.

Work with Members of Congress and Congressional staff to advance legislative initiatives that support warfighter protection.

Legislative Efforts

Rep. Niki Tsongas, D-MA 5, House Armed Services Committee

Sen. Carl Levin, D-MI, Chairman, Senate Armed Services Committee

Rep. Norm Dicks, D-WA 6, Ranking Member, House Appropriations Subcommittee on Defense

Sen. Scott Brown, R-MA, Senate Armed Services Committee

Members of the House and Senate Armed Services Committees

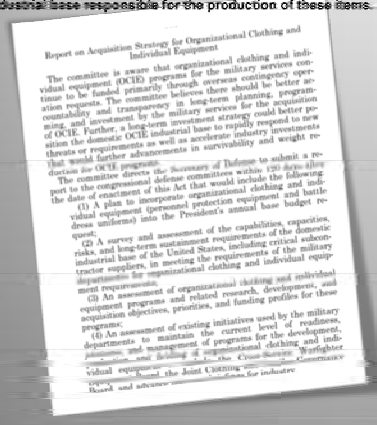
Soldier Equipment Study and Working Group

The Lexington Institute, a prominent Washington, DC-based think tank, conducted an independent study on Soldier Equipment preparedness and long-term funding issues. The WPRC served as a key resource to the Lexington Institute during their research.

The WPRC worked with the Lexington Institute to facilitate press coverage and Capitol Hill distribution of the study. We have worked with the Lexington Institute to encourage continuous coverage of the issue.

Legislative Efforts

FY11 NDAA: Language requiring the DoD to issue a report that assess and reports back to Congress the methods through which organizational clothing and individual equipment is procured, the longevity of this plan, and if there are plans in place to ensure continued support of the domestic industrial base responsible for the production of these items.



Report on Acquisition Strategy for Organizational Clothing and Individual Equipment

The committee is aware that organizational clothing and individual equipment (OCIE) programs for the military services continue to be funded primarily through overseas contingency operation requests. The committee believes there should be better accountability and transparency in long-term planning, programming, and investment by the military services for the acquisition of OCIE. Further, a long-term investment strategy could better position the domestic OCIE industrial base to rapidly respond to new threats or requirements as well as accelerate industry investments that would further advancements in survivability and weight reduction for OCIE programs.

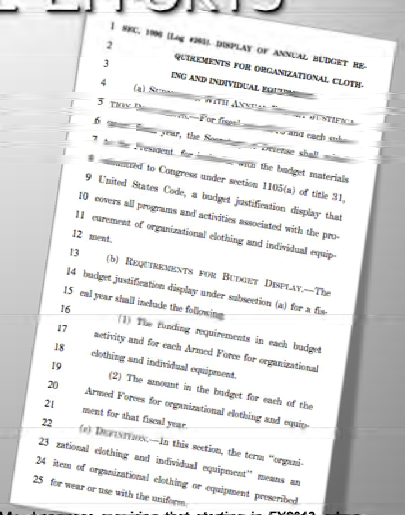
The committee directs the Secretary of Defense to submit a report to the congressional defense committees within 120 days after the date of enactment of this Act that would include the following:

(1) A plan to incorporate organizational clothing and individual equipment (personnel protection equipment and battle dress uniforms) into the President's annual base budget request.

(2) A survey and assessment of the capabilities, capacities, risks, and long-term sustainment requirements of the domestic industrial base of the United States, including critical subcontractor suppliers, in meeting the requirements of the military departments for organizational clothing and individual equipment requirements.

(3) An assessment of organizational clothing and individual equipment programs and related research, development, and acquisition objectives, priorities, and funding profiles for these programs.

(4) An assessment of existing initiatives used by the military departments to maintain the current level of readiness, production, and funding of organizational clothing and individual equipment, including the Cross-Service Warfighter Board and advance procurement authorities for industrial



SEC. 1008 [Log #3651]. DISPLAY OF ANNUAL BUDGET REQUIREMENTS FOR ORGANIZATIONAL CLOTHING AND INDIVIDUAL EQUIPMENT.

(a) SUBMISSION WITH ANNUAL BUDGET JUSTIFICATION DISPLAY.—For fiscal year, the Secretary of Defense shall submit to the President for inclusion with the budget materials submitted to Congress under section 1105(a) of title 31, United States Code, a budget justification display that covers all programs and activities associated with the procurement of organizational clothing and individual equipment.

(b) REQUIREMENTS FOR BUDGET DISPLAY.—The budget justification display under subsection (a) for a fiscal year shall include the following:

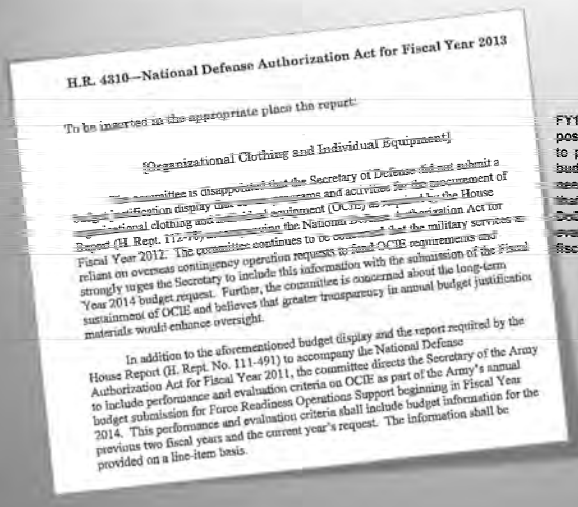
(1) The funding requirements in each budget activity and for each Armed Force for organizational clothing and individual equipment.

(2) The amount in the budget for each of the Armed Forces for organizational clothing and equipment for that fiscal year.

(c) DEFINITIONS.—In this section, the term "organizational clothing and individual equipment" means an item of organizational clothing or equipment prescribed for wear or use with the uniform.

FY12 NDAA: Language requiring that starting in FY2013, when the DoD submits its annual budget request to the President, that it also include "budget justification display" covering all programs and activities related to the procurement of organizational clothing and individual equipment. OCIE is defined as anything worn as part of or in use with the uniform.

Legislative Efforts



H.R. 4310—National Defense Authorization Act for Fiscal Year 2013

To be inserted in the appropriate place the report:

[Organizational Clothing and Individual Equipment]

The committee is disappointed that the Secretary of Defense did not submit a budget justification display that covers programs and activities for the procurement of organizational clothing and individual equipment (OCIE) as required by the House Report (H. Rept. 112-78) accompanying the National Defense Authorization Act for Fiscal Year 2012. The committee continues to be concerned that the military services are reliant on overseas contingency operation requests to fund OCIE requirements and strongly urges the Secretary to include this information with the submission of the Fiscal Year 2014 budget request. Further, the committee is concerned about the long-term sustainment of OCIE and believes that greater transparency in annual budget justification materials would enhance oversight.

In addition to the aforementioned budget display and the report required by the House Report (H. Rept. No. 111-491) to accompany the National Defense Authorization Act for Fiscal Year 2011, the committee directs the Secretary of the Army to include performance and evaluation criteria on OCIE as part of the Army's annual budget submission for Force Readiness Operations Support beginning in Fiscal Year 2014. This performance and evaluation criteria shall include budget information for the previous two fiscal years and the current year's request. The information shall be provided on a line-item basis.

FY13 NDAA: Language reiterating the Congress's position that the DoD, specifically the Army, needs to put a spotlight on the clothing and equipment budgets and give Congress the information it needs to keep those budgets sustained. Pending that passage of this year's NDAA, starting in FY14, DoD will be required to submit performance and evaluation criteria for the two previous and current fiscal years on a line-item basis.

MA Technology Development Corp. SBIR Targeted Technologies "*START*" Program

Jerry Bird
President, MTDC
May 29, 2012

MTDC

START Program Overview

Overview:

A $6 million fund to support the commercialization of technologies developed under Phase II SBIR contracts

Goals:

- Taking technologies developed under SBIR and priming them for commercialization
  - Generate patents
  - Build prototypes
  - Perform market research
  - Write fundable business plans
- Create fast growing MA companies by providing funding as well as coaching, business planning and introductions to potential investors

Supporting the Innovation Economy

- *START* is focused on activities essential to successful commercialization, to help support promising MA companies looking to grow and stay here in the Commonwealth
- State support of the innovation ecosystem
- Leveraging federal dollars into high growth companies moving towards the private sector

MTDC

The Importance of SBIRs to the State

Massachusetts has long been a national leader in SBIR grants and dollars received

- 2nd in the nation in dollars received
- 1st in dollars received per capita
- $3.8 billion in commercial sales of SBIR technologies generated to date
- MA has consistently been awarded nearly 13% of all SBIRs

MTDC

SBIR Success Stories

Company	Technology
A123	Battery manufacturer
Agiltron	Optical components manufacturer
Foster-Miller	Military robot manufacturer
Giner	Electrolyzer manufacturer
Inflexxion	Healthcare software developer
iRobot	Consumer and defense robotics manufacturer
Physical Sciences	Medical and environmental sensors
Symantec	Security software manufacturer
Triton	Advanced materials developer

START Program Details

3 Stages over 3 years

- $100,000 each to 10 Massachusetts applicants that have won Phase II SBIR contracts
- Based on progress demonstrated over the first year, an additional Stage II grant of up to $200,000 will be awarded to the five most promising companies
- At the end of the second year, two companies will be chosen for a $500,000 investment based on their potential for growth and profitability
- **This process is renewed yearly!**

Eligibility

- Massachusetts based companies that has received Phase II funding within the last 3 years
- The company must demonstrate a significant, addressable market for its technology
- Well planned use of proceeds that will take company to commercialization
- Life sciences and energy/clean-tech will not be considered under *START* as other Massachusetts programs support them.

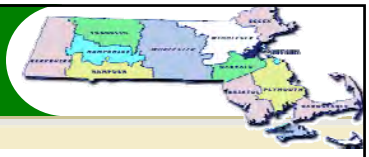
MTDC

Key Dates

Event	Date
RFP Release	March 27, 2012
Application deadline	Friday, April 27, 2012, 12:00pm est
Presentations by selected applicants to START review board	Thursday, May 24, 2012
Stage 1 agreements signed	Friday, June 15, 2012
Stage 1 winners announced	Thursday, June 28, 2012

MTDC

Summary



- The State and MTDC are committed to fueling the innovation economy in the Commonwealth
- MTDC has a strong track record of helping companies grow and achieve profitability
- A unique program to address Massachusetts' unique situation

MTDC

Questions?

www.mtdc.com/start

MTDC

WHO WE ARE

BEN EINSTEIN

- Product designer & entrepreneur
- Principal @ **Brainstream Design** (3 years)
- Product vision and prototyping expert
- Developed >15 commercially available products

SCOTT MILLER

- Manufacturing expert
- VP Engineering @ **iRobot** (10 years)
- Founder & CEO @ **Dragon Innovation**
- Manufacturing many VC-backed startup hardware products

AXEL BICHARA

- Venture capital investor with mechanical engineering background
- Partner @ **Atlas Venture** (19 years)
- Lead investor in **SolidWorks**
- 7 funds totaling $2.65B

Bolt is a

TOOLKIT

for

HARDWARE STARTUPS

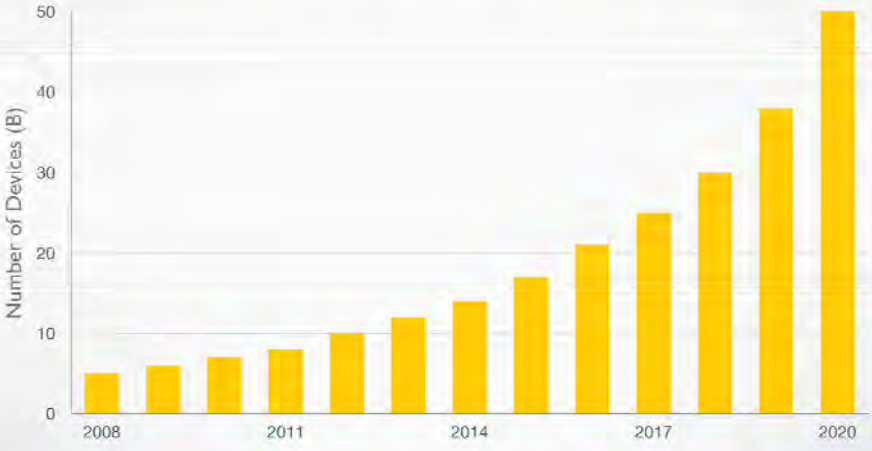
Initially

FOCUSED ON CONNECTED DEVICES

(otherwise known as M2M)

Exponential growth over next 10 years

50B BY 2020 [$4.2T]



BOLT

Reinventing Invention

A few example verticals:

CONSUMER ELECTRONICS

IROBOT ROOMBA
(Scott manufactured)

GEAR4 UNITYREMOTE
(Ben created/developed/licensed)

SLIM DEVICES

BOLT

Reinventing Invention

A few example verticals:

QUANTIFIED SELF

JAWBONE UP

FITBIT ULTRA

NIKE FUEL

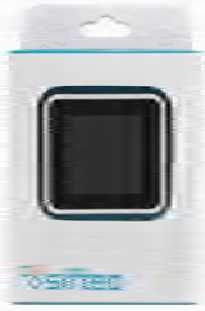
BOLT

Reinventing Invention

A few example verticals:

GAMING & EDUCATION

LEGO MINDSTORMS



SIFTED CUBES

(Scott manufactured)

~~ORBOTIX SPHERO~~

(Scott manufactured)

BOLT

Reinventing Invention

A few example verticals:

CONNECTED HEALTH

CAMBRIDGE CONSULTANTS T-HALER

VITALITY GLOWCAPS

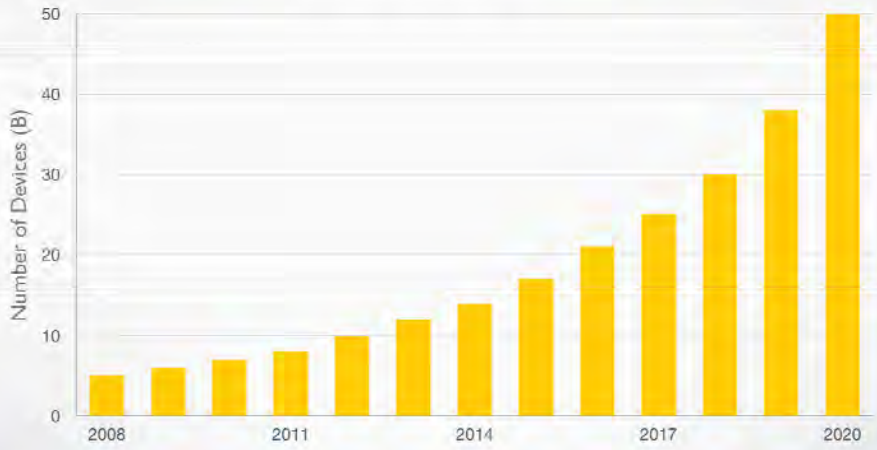
(Scott manufactured)

ZEO SLEEP MANAGER

(Scott manufactured)

Again,

50B BY 2020 [$4.2T]



Again,

50B BY 2020 [$4.2T]

Over the past decade

BUILDING WEB STARTUPS

has become

FAST/CHEAP/PREVALENT

A big contributor is

ACCELERATOR PROGRAMS

Y Combinator

techstars

500startups

A few example

PORTFOLIO COMPANIES

airbnb $1B valuation

Dropbox $5B valuation

$212M acquisition heroku

But they

ONLY HELP WEB STARTUPS

WE HAVE ONE GOAL:

FIND & ATTRACT
THE WORLD'S BEST
HARDWARE
ENTREPRENEURS

& GIVE THEM THE TOOLS

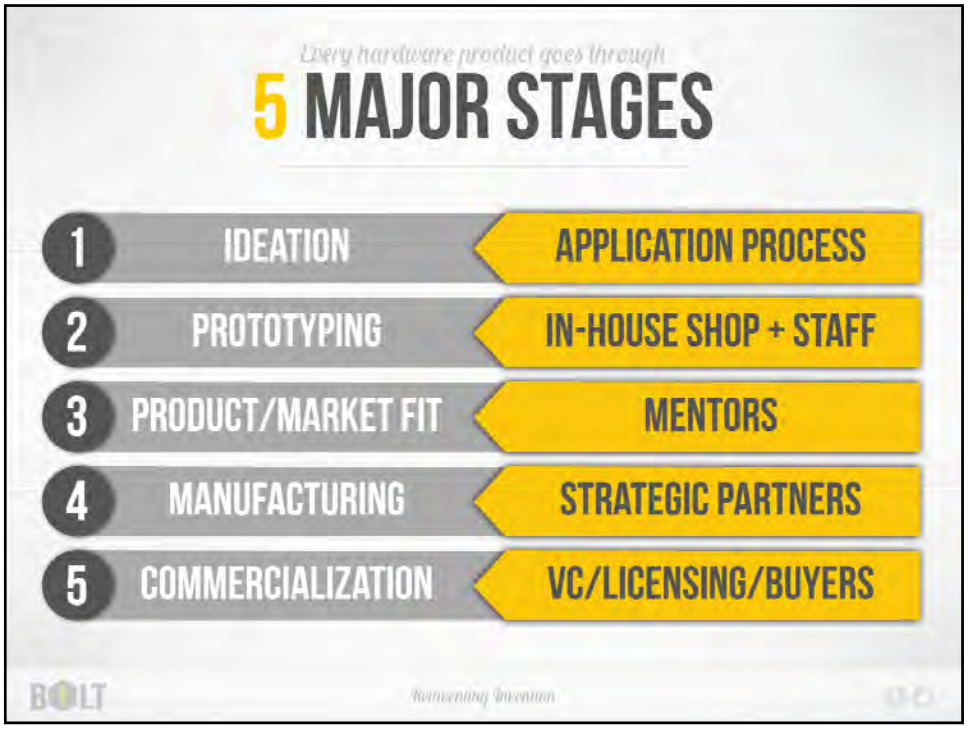
TO GET TO MARKET FASTER CHEAPER BETTER

HOW?

Every hardware product goes through

5 MAJOR STAGES

1. IDEATION
2. PROTOTYPING
3. PRODUCT/MARKET FIT
4. MANUFACTURING
5. COMMERCIALIZATION

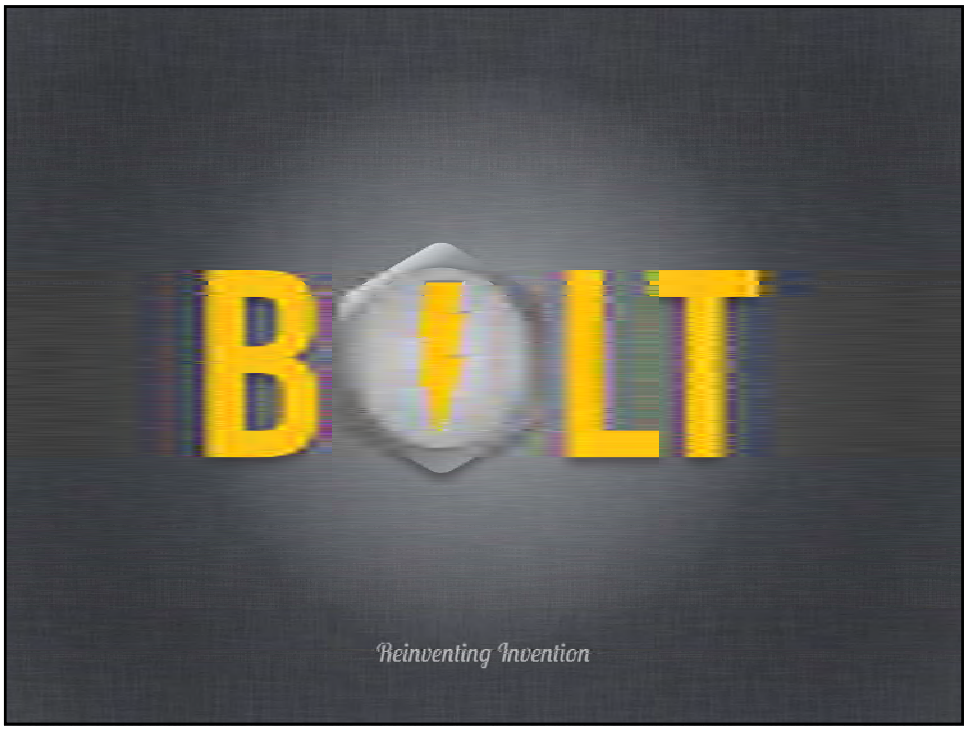

Every hardware product goes through
5 MAJOR STAGES
1 IDEATION
APPLICATION PROCESS
2 PROTOTYPING
IN-HOUSE SHOP + STAFF
3 PRODUCT/MARKET FIT
MENTORS
4 MANUFACTURING
STRATEGIC PARTNERS
5 COMMERCIALIZATION
VC/LICENSING/BUYERS
BOLT
Reinventing Invention


Verticals for
STRATEGIC PARTNERS
CAD/CAM
OEMs/MANUFACTURERS
ELECTRONICS DISTRIBUTORS
INFRASTRUCTURE PROVIDERS
CMs/SCMs
BOLT
Reinventing Invention

What

BOLT OFFERS STRATEGICS

1. ACCESS TO STARTUPS + CUSTOMERS
2. MARKETING & VISIBILITY
3. EARLY EXPOSURE TO ACQUISITION TARGETS
4. EQUITY IN ~24 HIGH-GROWTH STARTUPS




QUESTIONS/DISCUSSION
BOLT
Reinventing Invention

Strategic Outreach Information Brief

THE PERFORMANCE CENTER INITIATIVE

A SCIENCE CENTER FOR TACTICAL ATHLETE PERFORMANCE AND ENGINEERED SOLUTIONS

May 2012

THE CHALLENGE

THE U.S. ARMY IN A TIME OF TRANSITION – BUILDING A FLEXIBLE FORCE*

REDUCED BUDGET

"Multiple initiatives are under way to ensure that the Army continues to improve the **stewardship of its resources** and increase its return on the investment of public dollars"

BALANCING ACT

"Ultimately, maintaining the Army the country requires with fewer resources will mean **balancing three variables**: the overall **size of the force, its equipment, and its training and readiness**."

PROCESS REFINEMENT

"broad-based reforms of the processes that support key Army functions, **changes to how the army defines its equipment needs**"

Gen. Ray Odierno, CSA May/June Edition Foreign Affairs 25 April 12

We cannot simply return to the old way of doing things, and we cannot forget the lessons we have learned. As described in the Department's recently released strategic guidance, we should adjust our missions, our posture, and our organizational structure in order to adapt to ever evolving challenges and threats.

Gen. Martin Dempsey CJCS testimony to Congress 16 Feb 2012

"It's the **human dimension** that will get us through this, and we have to think our way through it, not bludgeon our way,"

Gen. Martin Dempsey CJCS Joint Warfighting Conference 17 May 2012

MANAGEMENT OF S&T PORTFOLIO

- Provide a discipline and structure to planning and execution
- Develop effective partnerships across organizational stovepipes
- Better synchronize our programs with Army priorities

LABORATORY MANAGEMENT

"While I believe we are generally well-positioned to weather the current budget climate, **I do have major concerns** with the long term **health of our laboratory and center system**. Without the **world-class cadre of scientists and engineers**, and the **infrastructure that supports their work**, the Army S&T enterprise would be in **serious trouble**"

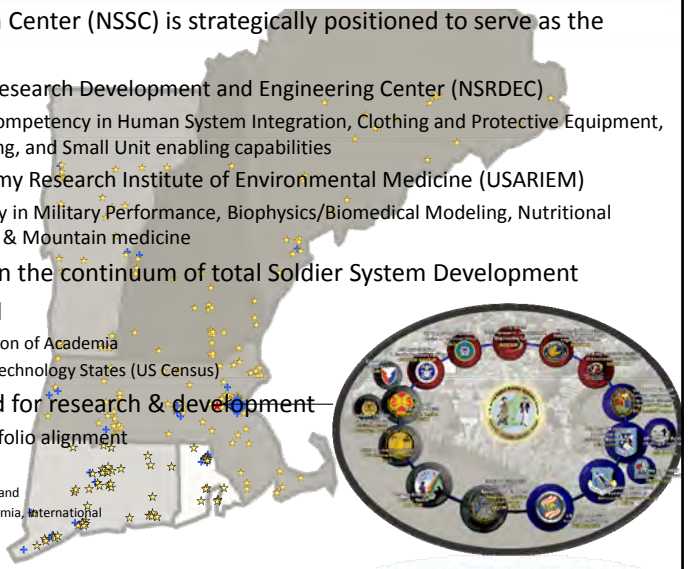
Dr. Marilyn Freeman DASA R&T testimony to Congress 29 Feb 12

ARMY S&T (SOLDIER) RESPONSE: THE SOLDIER PERFORMANCE CENTER

ESTABLISH	DEVELOP	IMPLEMENT
A Soldier-centric, scientifically informed **coordinative body** to integrate and synchronize agencies and efforts that "touch", "inform" and "impact" the platform-Soldier	A premier **scientific facility**, incorporating **satellite sites**, for holistic Soldier system optimization where tactical athletes, materiel and capability providers, and life science professionals will collaboratively conduct research, experimentation, and focused training to enable resource efficiencies.	Optimized **policies, procedures and best practices** for knowledge transfer, trade space analysis, and development of roadmaps influenced by tactical outcome
RESULTING IN ***EMPOWERING*** **senior leaders with analytical base to make informed and efficient decisions that enable a synchronized, agile, and decisive force**	RESULTING IN ***UNBURDENING*** **our nation's most deployed asset, our Soldiers, by balancing materiel capabilities and human system affordances**	RESULTING IN ***PROTECTING*** **the ability to transform towards a leaner more agile force that remains adaptive, innovative, versatile and ready to meet the needs of our Nation**

CATALYST FOR CHANGE

- Natick Soldier System Center (NSSC) is strategically positioned to serve as the catalyst
  - Home of Soldier Research Development and Engineering Center (NSRDEC)
    - Core Technical Competency in Human System Integration, Clothing and Protective Equipment, Nutritional Fueling, and Small Unit enabling capabilities
  - Home of the US Army Research Institute of Environmental Medicine (USARIEM)
    - Core Competency in Military Performance, Biophysics/Biomedical Modeling, Nutritional Fueling, Thermal & Mountain medicine
- NSSC is a "hub" within the continuum of total Soldier System Development
- Geographically suited
  - World Highest Concentration of Academia
  - MA is One of Six Leading Technology States (US Census)
- Behaviorally postured for research & development
  - Skin-in to skin-out portfolio alignment
  - Proven partnerships
    - Massachusetts & New England
    - DoD, OGAs, Industry, Academia, International



"They have access to the best and **world-renowned universities, and high caliber research facilities and hospitals**," Spilka said. "They work with **cutting edge private technology companies**, and also partner with many schools in region, not only using them as helpers but turning kids on to the STEM education area – science, technology, engineering, and math." ***Massachusetts State Senator Karen Spilka 2 May 2012***

BUILDING A NEW FUTURE

Core Team Functions

- Needs & Requirements Definition
  - Collaboration Processes
  - Outputs & Products
  - Create Push<->Pull
- Funding
- Policy

Develop the Performance Center

- Core Coordinative Body
  - Inclusion Criteria
  - Organization & Operational Concept
- "Social Network" definition & development
- Linkages to:
  - Other Government Agencies
  - Institutional training
  - Academic research
  - Leading technology providers

Vision

- Shared Consciousness & Purpose
- Inclusion & Transparency
- Teaming & Trust

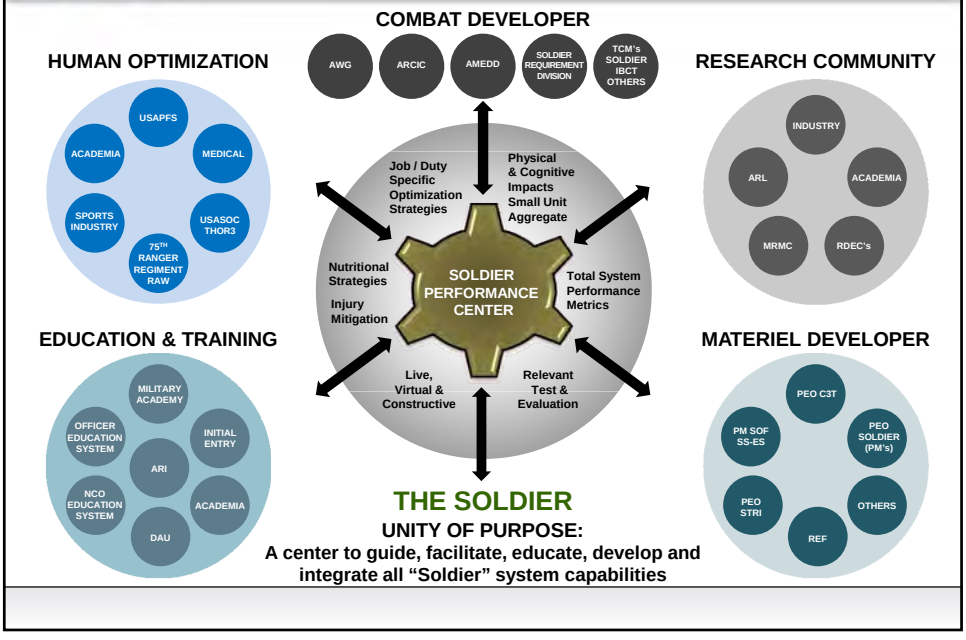
Architectural Design

- Performance Lab Vision
- Core Lab Capabilities & Instrumentation
- Satellite Communications
- Learning Environments
- On-site housing
- Rapid Prototyping

The Future

"Preserving and enhancing our ability to Prevent, Shape and Win requires a properly balanced and deployable force structure and appropriate investments in Soldiers and leaders, modernization of equipment to include the Army's network, and first-class training."
2012 Army Strategic Planning Guidance

SOLDIER PERFORMANCE CENTER CONCEPT



UNITY OF PURPOSE:
A center to guide, facilitate, educate, develop and integrate all "Soldier" system capabilities

BIOGRAPHY

UNITED STATES AIR FORCE

DR. TIM RUDOLPH

Dr. Tim Rudolph, a Senior Level executive, is the Systems Planning, Research, Development and Engineering Level III Technical Adviser, Air Force Integrated Information Capabilities, Electronic Systems Center, Hanscom Air Force Base, Mass. He serves in a variety of capacities, including ESC Chief Technology Officer, Chief Architect and as the Secretary of the Air Force-appointed Department of Defense Next Generation Air Transportation System Chief Architect. Dr. Rudolph works with senior technical representatives from the program executive offices across product center enterprise capabilities and with representatives from the Office of the Assistant Secretary of the Air Force for Acquisition, the Chief Management Officer and the Air Force's Command, Control, Communications and Computer Systems Chief Information Officer. As part of the ESC Engineering Directorate, he leads a number of department, multi-service, and multi-agency initiatives.

Dr. Rudolph has been appointed the Air Force Command and Control Platform Information Technology Designated Accreditation Authority. The DAA responsibility supports proven agility and speed in moving capabilities to the warfighter. Dr. Rudolph has also been delegated Research, Development, Test and Evaluation DAA authority for ESC programs, projects and facilities, in particular, supporting early systems engineering, developmental planning and exercises/demonstrations of capability development and delivery.

Dr. Rudolph gained system development experience in multiple IT companies. In March 1994, he co-founded Paradigm Technologies, Inc., an industry partner focused on the application of technologies in creative ways for multiple agencies and commercial enterprises, which he managed until divesting in 2007. He is a recognized pioneer in network-based services, open systems and open technology development, such as development on high-level architecture and Posix standards, as well as modeling, simulation and analysis technologies, with extensive experience leading government and industry partners to advance technologies for enterprise solutions.

Dr. Rudolph has applied experience in multiple technical disciplines through all phases of the acquisition lifecycle, including requirements analysis, architecture, high-level design, development, integration, test, fielding and support. He has held a number of positions supporting a range of Air Force, multi-service, joint, and cross-department federal activities. He is a certified system engineering Professional by the International Council on Systems Engineering.

EDUCATION

1985 Bachelor of Science degree in computer engineering/international strategic studies, University of Massachusetts, Amherst, Mass.
1994 Master of Science degree in technology and innovation, Boston University, Boston, Mass.
2002 Doctor of Philosophy degree in management science, Columbus University, Ohio.
2008 Force Senior Executive Warfighter Perspective Seminar, Air University, Maxwell AFB, Ala.

CAREER CHRONOLOGY

1. 1984 - 1986, senior programmer/analyst, Unisys/Systems Development Corporation, Cambridge, Mass.
2. 1987 - 1991, Test and Project Manager, RJO Enterprises, Lanham, Md.
3. 1991 - 1994, Command Decision Systems Program Manager, Science Applications Corporation International, Cambridge, Mass.
4. 1994 - 2008, Founder and Vice President, Paradigm Technologies, Inc., Bedford, Mass.
5. January 2008 - present, Technical Adviser, Air Force Integrated Information Capabilities, Electronic Systems Center, Hanscom AFB, Mass.

PROFESSIONAL MEMBERSHIPS AND ASSOCIATIONS

Institute of Electronic and Electrical Engineers, including multiple Standards Committees Air Force Association Armed Forces Communications and Electronics Society
(Current as of June 2011)

MASSACHUSETTS
HIGHTECHNOLOGYCOUNCIL

Dedicated to Growth... Committed to Action

Christopher R. Anderson

Christopher R. Anderson is president of the Massachusetts High Technology Council, Inc. Before becoming president in January 2001, he served as vice president and general counsel for the Council.

He joined the Council in 1984 and is responsible to the Board of Directors for the successful development and implementation of public policy programs and initiatives in Massachusetts and in Washington, D.C. that help make Massachusetts the world's most attractive place to create, operate, and expand technology businesses.

Mr. Anderson is directly involved in resolving conflicts and advocating positions on a broad range of state and federal public policy, legislative and regulatory issues. Those issues include tax and fiscal policy, energy, education, workforce training, environment, and health care.

In January 2006, Mr. Anderson was appointed to serve as a member of the state Board of Education (BOE), the nine-member panel that oversees state K-12 education policy. From November 2006 through August 2007, he served as Chairman of the BOE, an appointment designated by former Massachusetts Governor Mitt Romney.

In December 2003, he became president of the Massachusetts Defense Technology Initiative, a public-private partnership that led the Commonwealth's successful efforts to preserve Hanscom Air Force Base and Natick Soldier Systems Center through the U.S. Defense Department's 2005 Base Closing process.

In January 2009, Mr. Anderson was named to the Hanscom Air Force Base Honorary Commander program, which is designed to create deeper ties between the Air Force and the New England region and to increase public understanding of the Hanscom AFB and Air Force missions. The honorary commander program pairs community leaders with center and wing leaders to forge relationships and uses creative, unique activities to immerse honorary commanders into the wings; Mr. Anderson will serve as the honorary commander for Hanscom's 653rd Electronic Systems Wing until 2011.

Mr. Anderson graduated from Lexington High School in Lexington, MA. He holds a bachelor of arts degree from the University of Notre Dame, and a law degree from Suffolk University School of Law.

Affiliations:

Honorary Commander, 653rd Electronic Systems Wing, Hanscom AFB, MA
Massachusetts Board of Education, Member; Chairman 2006 - 2008
Massachusetts Port Authority Security Advisory Council
Dean's Advisory Committee, Suffolk University Law School
Business Advisory Council, Bentley College
American Bar Association
Boston Bar Association

Dr. Theresa A. Baus

Dr. Theresa A. Baus is currently Head of the Technology Partnerships Office (TPO) and Head, Office of Research And Technology Applications (ORTA) at the Naval Undersea Warfare Center Division, Newport. She is responsible for business planning and development of the Division's technology enterprise. The TPO encompasses all aspects of partnering activities with industry, academia, state and local governments and other federal laboratories. The TPO is active in the Navy and DOD SBIR programs, Industrial R&D programs as well as technology transfer efforts including Cooperative Research and Development Agreements (CRADA), Work For Private Party agreements, patent licensing and Education Partnerships.

Dr. Baus is the recipient of the 2009 Department of Defense George Linsteadt Technology Transfer Achievement Award, the inaugural Federal Laboratory Consortium for Technology Transfer (FLC) Outstanding Technology Transfer Professional Award in 2007 and the FLC Harold Metcalf Award in 2010. Due to her efforts, Division Newport has won four FLC Excellence in Technology Transfer Awards for technologies developed and commercialized at the Division. Currently the FLC Vice Chair, she was the Northeast Regional Coordinator for the FLC from 2006 to 2009.

Previous to her appointment as Head, TPO, Dr. Baus was the Technology Transfer Manager and ORTA at Division, Newport, for 7 years and facilitated access to the Division's unique expertise, equipment and facilities necessary for successful product development. She joined the Division in 1990 as a member of the Mid Frequency Target Physics group and worked in the area of undersea acoustics until 1999.

Dr. Baus received a B.S. in Physics and Mathematics from the State University of New York at Stony Brook, a M.S. in Physics from Indiana University, Bloomington, and a Ph.D. in Applied Mathematics from the State University of New York at Stony Brook. She recently completed her M.P.A. at Indiana University School of Public and Environmental Affairs under the Naval Sea Systems Command (NAVSEA) Executive Education Program.

Peter L. Antoinette

President & Chief Executive Officer
Nanocomp Technologies, Inc.

Peter co-founded Nanocomp Technologies, Inc. in 2004 and serves as its President and Chief Executive Officer. Prior to founding Nanocomp Technologies, he was the President and CEO of Cambridge Research & Instrumentation Inc., (Woburn, MA) a photonics company, commercializing liquid crystal based optical technology for telecommunications and high performance imaging. Previously, he spent fifteen years with Millipore Corporation (Bedford, MA) a Fortune 500 leader in separations technology, in Sales, Marketing, Technical Services, and as a Vice President and Divisional Manager.

Peter also is a Director of the New Hampshire High Tech Council; Chairman of the Industrial Advisory Board for the NSF Center for High-rate Nanomanufacturing (Boston, MA); member of United States Senator Jeanne Shaheen's Small Business Advisory Council, served on President Obama's National Nanotechnology Advisory Panel for the President's Council of Advisers on Science and Technology, and is a former Mass High Tech All-Star.

He is the holder of four patents, and co-inventor of several pending patents.